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10/586,398	07/17/2006	Ei Igarashi	293322US8PCT	2536
22850	7590	12/24/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.			LE, QUANG V	
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ALEXANDRIA, VA 22314			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/586,398	Applicant(s) IGARASHI, EI
	Examiner QUANG V. LE	Art Unit 2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 17 July 2006.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-19 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 17 July 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/DS/06)
 Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application

6) Other: _____

DETAILED ACTION

1. This Office Action is in response to the application 10/586398 filed on 7/17/2006.
2. **Claims 1-19** have been examined and are pending.

Information Disclosure Statement

3. An initialed and dated copy of Applicant's IDS form 1449 is attached to the instant office action.

Priority

4. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-4 and 9-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Abu Ryosuke, JP Publication No. 2003-049823, in view of Sadler et al., US Patent No. 5,841,635.

As per claim 1, a pivot hinge mechanism supporting a main body and pivotable unit pivotably in relation to each other, the pivot hinge mechanism has the following limitations, taught by Ryosuke:

A stationary plate installed to one of the main body and pivotable unit (paragraph 0005 and drawings 11-12).

Rotating plates installed to the other of the main body and pivotable unit (paragraph 0005 and drawings 11-12).

A spindle supporting the rotating plates rotatably in relation to the stationary plate (paragraph 0005 and drawings 11-12).

The stationary and rotating plates having formed therein openings through which a harness routed between the main body and rotating portion is penetrated (paragraph 0011).

Ryosuke does not teach the following limitations, but Sadler who teaches a flexible printed circuit for split keyboard does:

The opening **42** in the stationary plate **14** and those in the rotating plates **18** being formed for at least a part thereof to overlap each other in an angular range in which the pivotable unit is pivoted in relation to the main body (figure 6). *Notice the opening 42*

includes the annular cavity that houses portion of the printed circuit board web 50 (col 4, lines 26-40)

Therefore, to one of ordinary skill in the art, it would have been an obvious matter of design choice at the time the invention was made to modify Ryosuke hinge mechanism to allow the electrical connection to be routed through thin openings like Sadler flexible print circuit board design. Such design would minimize the size of the hinge and allow more electrical traces, or leads per volume through the hinge (Sadler).

As per claim 2, Ryosuke and Sadler teach the pivot hinge mechanism according to claim 1, Sadler further teaches wherein the opening in the stationary plate and those in the rotating plates are formed to have a nearly circular shape having a predetermined width and extending divergently in a predetermined angular range about the spindle (see figure 6).

As per claim 3, Ryosuke and Sadler teach the pivot hinge mechanism according to claim 2, Sadler further teaches wherein the angular range of the openings in the stationary and moving plates is larger than a half of a maximum angle through which the pivotable unit is pivoted in relation to the main body and smaller than the maximum angle (figure 5A and 5B). *It is obvious from the figures that the opening including cavity 36 has an angular range larger than half the maximum angle of the pivoting unit travel.*

As per claim 4, Ryosuke and Sadler teach the pivot hinge mechanism according to claim 1, Sadler further teaches wherein the harness is a flexible printed circuit board and can be folded back between the openings in the stationary and moving plates in which the folded-back portions of the flexible printed circuit board overlap each other (col 1, line 62-66 and figure 6). *From figure 6, the portion of flexible printed circuit board 50 are folded back and overlapped with each others.*

As per claim 9, an imaging device, has the following limitations, taught by Ryosuke:

A main body having provided therein an imaging unit to capture an image of an object (paragraph 0003).

A grip unit having provided therein a recording unit to record the image captured by the imaging unit and installed pivotably to one side of the main body (paragraph 0003).

A pivot hinge mechanism supporting the main body and pivotable unit pivotably in relation to each other (paragraph 0004),

The pivot hinge mechanism including a stationary plate installed to one of the main body and pivotable unit, rotating plates installed to the other of the main body and pivotable unit, and a spindle supporting the rotating plates rotatably in relation to the stationary plate (paragraph 0005 and drawings 11-12).

The stationary and rotating plates having formed therein openings through which a harness routed between the main body and rotating portion is penetrated (paragraph 0011).

Ryosuke does not teach the following limitations, but Sadler who teaches a flexible printed circuit for split keyboard does:

The opening **42** in the stationary plate **14** and those in the rotating plates **18** being formed for at least a part thereof to overlap each other in an angular range in which the pivotable unit is pivoted in relation to the main body (figure 6). *Notice the opening 42 includes the annular cavity that houses portion of the printed circuit board web 50 (col 4, lines 26-40)*

Therefore, to one of ordinary skill in the art, it would have been an obvious matter of design choice at the time the invention was made to modify Ryosuke hinge mechanism to allow the electrical connection to be routed though thin openings like Sadler flexible print circuit board design. Such design would minimize the size of the hinge and allow more electrical traces, or leads per volume through the hinge (Sadler).

As per claim 10, this claim recites what was previously discussed in claim 2.

As per claim 11, this claim recites what was previously discussed in claim 3.

As per claim 12, this claim recites what was previously discussed in claim 4.

As per claim 13, Ryosuke and Sadler teach the imaging device according to claim 12, Sadler further discloses wherein the flexible printed circuit board has a portion bent in plane with a predetermined curvature and is folded back between the openings in the stationary and rotating plates where the bent portions overlap each other (see figure 6, item 50).

As per claim 14, Ryosuke and Sadler teach the imaging device according to 13, Sadler further discloses wherein the curvature radius of the bent portion is nearly equal to that, about the spindle, of the openings in the stationary and rotating plates (see figure 6 and item 50).

Ryosuke and Sadler disclose the claimed invention except for the amount of curvature radius of the bent portion nearly equal to openings. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sadler's flexible printed circuit board to meet claim limitation, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

6. **Claims 5-8 and 16-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryosuke and Sadler as applied to claims 1 and 9 above, further in view of Takagi et al., US Patent No. 6,226,448.

As per claim 5, Ryosuke and Sadler the pivot hinge mechanism according to claim 1, they fails to explicitly disclose the hinge mechanism further comprising a first friction mechanism and second friction mechanism, which give friction to between the rotating and stationary plates at the inner and outer walls thereof.

However, Takagi teaches a video tape recorder with a pivot hinge mechanism that a friction mechanism where the frictional resistance force is caused by a leaf spring (col 10, line 36-40).

Takagi discloses the claimed invention except for the second friction mechanism. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add a second friction mechanism, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.* Therefore, both the first and second friction mechanisms in this claim is taught by the same friction mechanism described in Takagi reference.

Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use Takagi two friction mechanisms to give friction force to the inner and outer wall of the pivot hinge mechanism, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse, 86 USPQ 70.*

Therefore, to one of ordinary skill in the art, it would have been an obvious matter of design choice at the time the invention was made to incorporate Takagi friction

mechanism into Ryosuke and Sadler hinge mechanism so as to provide a hinge mechanism that can move and stop stably at different angle position. Such hinge can be used in a video camera where the user can easily operate the camera with one hand.

As per claim 6, Ryosuke, Sadler and Takagi teach the pivot hinge mechanism according to claim 5, Takagi further discloses wherein the first friction mechanism includes a leaf spring 82, pressing plate and friction plate, disposed with the spindle being penetrated between the stationary plate and rotating plates, the leaf spring compressed between the stationary and rotating plates forcing the pressing plate which will thus be pressed to the friction plate to generate friction (col 10, lines 30-43).

As per claim 7, Ryosuke, Sadler and Tagaki the pivot hinge mechanism according to claim 5, Tagaki further discloses wherein the second friction mechanism includes: a peripheral annular plate including a ring portion being in sliding contact with the main side of the periphery of the rotating plate, opposite to the stationary plate, and a flange portion projecting from the periphery of the ring portion toward the stationary plate and in a direction in which the diameter is larger and which is installed to the stationary plate (see the leaf spring 82 and surrounding parts in figure 12); and a leaf spring fixed to the stationary plate and disposed being compressed between the stationary plate and periphery of the rotating plate, the leaf spring compressed between the stationary plate and periphery of the rotating plate pressing the rotating plate whose

periphery will thus be forced to the ring portion of the peripheral annular plate to generate friction (col 10, lines 30-43).

As per claim 8, Ryosuke, Sadler and Tagaki the pivot hinge mechanism according to claim 7, Tagaki further discloses wherein the second friction mechanism includes a second rotating plate supported rotatably on the spindle while catching the ring portion between itself and rotating plate and which is installed integrally to the rotating plate through inside the ring portion (col 10, lines 30-43 and figure 12).

As per claim 16, this claim recites what was previously discussed in claim 5.

As per claim 17, this claim recites what was previously discussed in claim 6.

As per claim 18, this claim recites what was previously discussed in claim 7.

As per claim 19, this claim recites what was previously discussed in claim 8.

7. **Claim 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryosuke and Sadler as applied to claim 12 above, further in view of Yamada et al., US Patent No. 4,681,421.

As per claim 15, Ryosuke, Sadler teach the imaging device according to claim 12, but they fail to explicitly disclose wherein the harness is a double-side printed circuit board.

However, Yamada teaches a double-face flexible printed circuit board can be used in a camera (col 2, line 16-20).

Therefore, to one of ordinary skill in the art, it would have been an obvious matter of design choice at the time the invention was made to apply double-face printed circuit board of Yamada to Ryosuke and Sadler printed circuit board. Such circuit design would be useful for arranging electrical circuit elements in extremely limited space.

Conclusion

8. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure:

Kosako, Kosei et al. (US 20030200626 A1) Hinge structure

Miyahara; Masato et al. (US 5256075 A) Connector device

Kuivas, Juha et al. (US 20040212956 A1) Mobile Terminal with synchronizing hinge

Begin; Christophe (US 5692589 A) Mechanism for controlling a rotary member by means of a pivoting handle, and seat equipped with such a mechanism

Kosako, Kosei et al. (US 20030193783 A1) Structure for guiding flexible printed wiring board through a hinge portion between a body and a swingable member

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang V. Le whose telephone number is (571) 270-

5014. The examiner can normally be reached on Monday through Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Yen Ngoc Vu can be reached on (571)272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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